



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/567,112

03/06/2007

Thomas Dobbertin

03100277AA

2907

30743

7590

07/07/2010

WHITHAM, CURTIS & CHRISTOFFERSON & COOK, P.C.  
11491 SUNSET HILLS ROAD  
SUITE 340  
RESTON, VA 20190

EXAMINER

CLARK, GREGORY D

ART UNIT

PAPER NUMBER

1786

MAIL DATE

DELIVERY MODE

07/07/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/567,112	<b>Applicant(s)</b> DOBBERTIN ET AL.	
	<b>Examiner</b> GREGORY CLARK	<b>Art Unit</b> 1786	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 and 17-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/06/2010</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

The examiner acknowledges the receipt of applicants' amendments/ arguments dated 05/06/2010. Claims 1-21 pending.

Rejections and objections made in previous office action that do not appear below have been overcome by applicant's amendments and therefore the arguments pertaining to these rejections/objections will not be addressed.

1. Newly submitted claims 1-4 and 17-20 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Applicant received an office action on merits based on an organic light emitting diode while the newly submitted claims are drawn to the method which is a patentably distinct invention.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 1-4 and 17-20 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 1786

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**2. Claims 5, 7, 9-10, 14-16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (US 5,281, 489) in view of Ichinose (US 3,926,858).**

**3. Regarding Claims 5 and 21,** Mori discloses an electroluminescent element, containing a hole moving/donating agent corresponding to the applicants' hole-injecting/hole-transporting zone, an electron moving/donating agent corresponding to the applicants' electron-injecting/electron-transporting zone (abstract). Mori also mentions that the electroluminescent element has an anode (column 28, lines 47-48) formed on a support (substrate) and a cathode (column 30, line 57).

Mori also mentions that electron transporting materials include zinc oxide (column 29, lines 23-28). Mori fails to mention the electron transporting zone is made of a moisture sensitive material.

Ichinose discloses a moisture sensitive semiconductor made of zinc oxide (abstract).

Based on the teaching of Ichinose zinc oxide is a moisture sensitive material. As such, the zinc oxide in the electron injecting and transporting zone of Mori would be considered as a moisture sensitive layer which reads on the instant limitations.

Mori discloses that the hole injecting layer (hole moving and donating) can contain a metal or non-metalphthalocyanine (column 4, lines 61-62).

Since the Mori suggests the use of phthalocyanine and the most basic structure would have hydrogen substitution, it would have been obvious to have used has H as the radical groups as claimed.

In addition, a film formed from a metal or non-metalphthalocyanine would cover the surface to which it is applied and be considered as an encapsulation layer (barrier layer per claim 21).

Mori further discloses that the hole injection/ transporting layer may be formed by vapor deposition and coating (column 29, lines 35-36).

The examiner interprets the term "coating" to be inclusive of a solution coating method that would include an aqueous coating (per claim 21).

4. **Regarding Claims 7 and 9**, Mori discloses that the electron injecting/transporting agent can be made from low molecular weight polycyclic aromatics with linear chains such as anthracene, tetracene, pentacene (column 8, line 49) (per claim 7). Mori also discloses that the electron injecting/transporting agent can be made from a metal or non-metalphthalocyanine (column 8, line 26) (per claim 9).

5. **Regarding Claim 10**, Mori discloses an electroluminescent element that includes a hole injection layer (hole moving and donating) (column 4, lines 61-62).

Mori discloses that the electroluminescent element includes at least one hole moving and donating agent. Mori further discloses that the hole injection/ transporting layer may be formed by vapor deposition and coating (column 29, lines 35-36).

The examiner interprets the term "coating" to be inclusive of a solution coating method that would include an aqueous coating.

Mori discloses that the injection/ transporting layer may be constitute two or more sub-layers (column 29, lines 44-47) corresponding to applicants' HIL1 and HIL2. Mori discloses that electrons and holes are injected from opposite electrodes (abstract). Mori fails to mention that the HIL2 is applied between HIL1 and the second electrode.

Since it is known in the electroluminescent art that the anode injects holes into the adjacent organic layer and the cathode inject electrons into the adjacent organic layer, the routine optimization of the device efficiency especially in terms of lower the driving/running voltage requirements and optimizing the luminescence output is often achieved by testing the device performance under various organic layer configurations which would include the claimed layer configuration.

The examiner takes the position that the sub- layers (HIL 1 and 2) of Mori are positioned next to each other adjacent to the second electrode and in the course of optimization of hole injection one would vary the location of both layers to optimize the electroluminescent element performance that would include HIL2 applied between HIL1 and the second electrode.

6. **Regarding Claims 14-16**, Mori discloses an electroluminescent element that includes a hole injection layer (hole moving and donating) (column 4, lines 61-62).

Art Unit: 1786

Mori discloses that the electroluminescent element includes at least one hole moving and donating agent. Mori further discloses that the hole injection/ transporting layer may be formed by vapor deposition and coating (column 29, lines 35-36).

The examiner interprets the term "coating" to be inclusive of a solution coating method that would include an aqueous coating (per claim 14-16).

**7. Claims 6, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (US 5,281, 489) in view of Pichler (US 6,402,579).**

**8. Regarding Claim 6,** Mori discloses an electroluminescent element, containing a hole moving/donating agent corresponding to the applicants' hole-injecting/hole-transporting zone, an electron moving/donating agent corresponding to the applicants' electron-injecting/electron-transporting zone (abstract). Mori also mentions that the electroluminescent element has an anode (column 28, lines 47-48) formed on a support (substrate) and a cathode (column 30, line 57). Mori fails to mention that the electron-injecting/electron-transporting zone is adjoined toward the anode.

Since it is known in the electroluminescent art that the anode injects holes into the adjacent organic layer and the cathode inject electrons into the adjacent organic layer, the routine optimization of the device efficiency especially in terms of lower the driving/running voltage requirements and optimizing the luminescence output is often achieved by testing the device performance under various organic layer configurations which would include the claimed layer configuration.

Art Unit: 1786

The examiner takes the position that it is common in the art to arrange layers in different configurations to achieve the desired device function whether to improve luminescent output or the lowering of drive/running voltage. Such routine variations would have included the electron-injecting/electron-transporting zone adjoined toward the anode.

Mori discloses that the anode is transparent (column 28, lines 48-50) and light from the luminous layer can pass through the anode (column 29, lines 7-9). Mori fails to teach a cathode applied to the substrate.

Pichler discloses an electroluminescent element where an anode can be formed over a substrate while the cathode is formed over an organic layer. Alternatively, the cathode can be formed over a substrate while the anode is formed over an organic layer (column 8, lines 42-47).

Pichler further indicates that the anode needs to be semi-transparent to preserve transparency when positioned is on top of the device (column 7, lines 33-46) and the anode is a light transmissive layer (column 8, line 37).

As Pichler teaches a device structure where either the anode or cathode can be applied to the substrate, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected from known device structures which would have included the device structure of Pichler (cathode applied to substrate) which reads on the instant limitations, absent unexpected results.

Mori also discloses that the electron injecting/transporting agent can be made from a metal or non-metalphthalocyanine (column 8, line 26). Since Mori suggests the

use of phthalocyanine and the most basic structure would have hydrogen substitution, it would have been obvious to have used H as the radical groups as claimed.

9. **Regarding Claims 11 and 13**, Mori discloses that the electron injecting/transporting agent can be made from low molecular weight polycyclic aromatics with linear chains such as anthracene, tetracene, pentacene (column 8, line 49) (per claim 11). Mori also discloses that the electron injecting/transporting agent can be made from a metal or non-metal phthalocyanine (column 8, line 26) (per claim 13).

10. **Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (US 5,281, 489) in view of Ichinose (US 3,926,858) and Tang (US 4,356,429).**

11. **Regarding Claim 8**, Mori teaches the invention of claim 6 but fails to mention the type of metal used in the metal phthalocyanine complex.

Tang discloses a organic electroluminescent device where the hole injection zone contains a metal phthalocyanine where the metals include Ni, Cu, Co and Cu (column 3, lines 60-64).

As Mori and Tang disclose organic electroluminescent devices with hole injection zones made of metal phthalocyanine complexes, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected from known metals used to complex with phthalocyanine which would have included those disclosed by Tang which read on the instant limitations, absent unexpected results.

**12. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (US 5,281, 489) in view of Pichler (US 6,402,579) and Tang (US 4,356,429).**

**13. Regarding Claim 12,** Mori teaches the invention of claim 6 but fails to mention the type of metal used in the metal phthalocyanine complex.

Tang discloses a organic electroluminescent device where the hole injection zone contains a metal phthalocyanine where the metals include Ni, Cu, Co and Cu (column 3, lines 60-64).

As Mori and Tang discloses organic electroluminescent devices with hole injection zones made of metal phthalocyanine complexes, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected from known metals used to complex with phthalocyanine which would have include those disclosed by Tang which read on the instant limitations, absent unexpected results.

### **Response to Amendment/Arguments**

Applicant argues that Mori fails to teach a phthalocyanine containing layer that simultaneously acts as a functional layer and a barrier or encapsulation layer.

The examiner counters the Mori discloses as device with a similar structure containing a phthalocyanine layer as the hole injection transporting zone. The phthalocyanine material due to the presence of aromatic ring would be inherently

Art Unit: 1786

hydrophobic and act as a barrier layer to reduce the moisture sensitivity of the underlying layers.

Applicant argues that Mori fails to teach a device structure where the anode is applied to the substrate.

The examiner counters that Pichler teaches a device structure where either the anode or cathode can be applied to the substrate, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected from known device structures which would have included the device structure of Pichler (anode applied to substrate), absent unexpected results.

The applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new grounds of rejection necessitated by the applicant's amendment.

### **Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 1786

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY CLARK whose telephone number is (571)270-7087. The examiner can normally be reached on M-Th 7:00 AM to 5 PM Alternating Fri 7:30 AM to 4 PM and Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/  
Supervisory Patent Examiner, Art Unit 1786

GREGORY CLARK/GDC/  
Examiner  
Art Unit 1786

Application/Control Number: 10/567,112  
Art Unit: 1786

Page 12